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ABSTRACT

This evaluation kit and guidelines are designed to help the teacher plan the classes' experience in the CISPUS Environmental Learning Center The kit includes a General Plan, Individual Teacher's Objectives, Kids' Expectations, Kids' Evaluation, and Parent's Evaluation (to be completed at a later date.) Included also in this kit for evaluating the CISPUS experience are the Teacher's and Evaluator's Handbooks. Copies of two documents appear in this kit. The first, entitled "A Teacher's Taxonomy of Learning Outcomes," by Dr. Harry W. Johnson, was presented at the First Annual Pacific Northwest Research and Evaluation Conference. The second document is part of a dissertation by Harry W. Johnson entitled "Certain Effects of Guiding Study-Type Reading by an Organized Pattern of Questions." (BT)

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CISPUS EVALUATION KIT

DRAFT

For BEST COPY AVAILABLE

Cispus Preparatory Workshop
June 12-14, 1973

Dr. Frank Brouillet
Superintendent of Public Instruction

SE 016 973

CISPUS EVALUATION KIT

CONTENTS

ONE: "GUIDELINES"

TWO: "A TEACHER'S TAXONOMY OF LEARNING OUTCOMES"

THREE: "TEACHER'S HANDBOOK"

FOUR: "EVALUATOR'S HANDBOOK"

FIVE: "THE FACTOR OF ORGANIZATION IN LEARNING"

SIX: "SKILL = SPEED X ACCURACY X FORM X ADAPTABILITY"

GUIDELINES

TO HELP YOU

PLAN YOUR GROUP'S SOJOURN

IN CISPUS

ENVIRONMENTAL LEARNING CENTER

A Checklist and

an Evaluation Plan

1972-1973

(Please return this copy, after completed, to Cispus.)

General Plan

1. Which of the following general types of purposes do you wish to serve by bringing your group? Please mark as many as apply:

A. ☐ Conservation
B. ☐ Outdoor Education
C. ☐ Science Education
D. ☐ Improve Intergroup Relations and Communications
E. ☐ Recreation
F. ☐ Survival Training
G. ☐ Humanities Education
H. ☐ Teacher Training
I. ☐ Improve Relations & Communications Between Generations
J. ☐ Individual Enrichment
K. ☐ Individual Maturation
L. ☐ Child Study
M. ☐ Other (please specify) _____

2. Who will be the person --

* _____ responsible for making planning decisions?
_____ responsible for directing the group while they are at Cispus?
_____ responsible for collecting evaluation data?
_____ responsible for arranging transportation?
_____ responsible for conducting the program?

3. What dates are you thinking of?

On _____ beginning, arriving at around _____ o'clock.
On _____ leaving at around _____ o'clock.
or On _____ beginning, arriving at around _____ o'clock.
On _____ leaving at around _____ o'clock.

4. About what sizes will your sub-groups be?

_____ adults
_____ about _____ years old
_____ about _____ years old

5. What kind of transportation do you plan to use to and from Cispus?

☐ District Buses ☐ Chartered Buses ☐ Private Cars

* Until and unless we are notified otherwise, we will communicate with this person about arrangements.

Superintendent

INDIVIDUAL TEACHER'S OBJECTIVES

SUGGESTED EVALUATION STEPS TO BE CARRIED OUT BY THE TEACHER TAKING A GROUP TO CISPUS	RIGHT NOW this percent of my class is there.	RIGHT AFTER Cispus this percent of my class is there.
A. Decide your class' goals for going to Cispus.		
B. Break the goals down into abilities, tendencies, and memories (experiences). The "Teacher's Taxonomy" described in the accompanying booklet is much simpler than Bloom & Krathwohl's and should be helpful to you in carrying out this step.		
C. Enter those in some of the blanks under "Objectives" below (perhaps 5 to 10 of the 21. List more than 3 under any category you wish, of course).		
D. Determine where each of your kids is on these "objectives".		
E. In the column next to this one -- "Right Now" -- show about what percent of your class has <u>already</u> <u>achieved</u> each of the "objectives" you have identified.		
F. Share this with other teachers.		
G. Plan, and prepare to determine, where each of your kids will be right after Cispus (then you'll <u>really</u> have objectives).		
H. With other teachers, plan to move your kids to your objectives.		
I. Right after Cispus, carry out those "G" plans, and record the results in the last column at the right.		
<u>OBJECTIVES</u>*		
ABILITIES: To Know --		
1.		
2.		
3.		
To Understand --		
1.		
2.		
3.		
Be Able to --		
1.		
2.		
3.		

* Actually, these are not complete "objectives" until you add <u>expected</u> levels for "RIGHT AFTER".

TEACHER'S OBJECTIVES (Cont.)	RIGHT NOW this percent of my class is there.	RIGHT AFTER Cispus this percent of my class is there.
-- TENDENCIES --		
be Interested in --		
1.		
2.		
3.		
Have a Habit of --		
1.		
2.		
3.		
Have the Attitude of --		
1.		
2.		
3.		
-- MEMORIES --		
Have had the Experience of --		
1.		
2.		
3.		

AT THE END OF EACH DAY AT CISPUS

Teachers' Log*

Date _____

The five major activities of the day were:

Ugh! Wow!

1. _____ ○ 0 1 2 3 4 5
2. _____ ○ 0 1 2 3 4 5
3. _____ ○ 0 1 2 3 4 5
4. _____ ○ 0 1 2 3 4 5
5. _____ ○ 0 1 2 3 4 5

The general type of purpose for each was [please enter in circle after activity -- see list of types A-M, p. 2]. The overall level of success for each was [please enter on scale after activity]:

The three best features of the day were:

1. _____
2. _____
3. _____

Our suggestions as to how the day could have been more profitably managed are:

_____
_____
_____
_____
_____

Teachers _____
_____
_____

[Please write any minority opinion on back.]

* To be filled out by a triad of teachers.

KIDS' EXPECTATIONS

UPON ARRIVING AT CISPUS

[Select randomly and interview one out of five kids]

Please record here, in writing, or on the tape with your voice, the answers to these eight questions.

1. What is the date today?_____ What school are you from? _____

2. Have you been to Cispus before? _____ What was the best experience you had at Cispus before? _____

3. Have you been away from home without your parents before? _____

4. What do you expect to do while you're at Cispus? _____

_____

5. What do you expect to like most? _____

6. What do you expect to like least? _____

7. How much part did you have in planning what you are going to do here at Cispus? (Circle the appropriate cross.)

+	+	+	+	+
I had no part	I had a little part	I had some part (about my share)	I had a large part	I planned it all

8. Guess who, from among your group, we are talking about when we say:

This one is always happy _____

This one is always worried _____

This one is the hardest worker _____

This one is the smartest out of class _____

This one is the best leader _____

This one can't take a joke _____

This one is always picking on others _____

This one never likes to do anything _____

This one has the most friends _____

This one has the fewest friends _____

You would most like to sit next to him or her _____

You would most like to work on a class project with him or her _____

You would most like to have him or her as your friend _____

KIDS' CLOSING ASSESSMENT

UPON LEAVING CISPUS

[Select randomly and interview one out of five kids*]

Please record here, in writing, or on the tape with your voice, the answers to these eight questions:

1. What is the date today? _____

2. What school are you from? _____

3. Who is your teacher or group leader? _____

4. What were the three best things that happened to you while you were at Cispus this time?
   1. _____
   2. _____
   3. _____

5. What experiences did you have which you had never had before?

   _____

   _____

   _____

   _____

6. What were the worst things that happened to you while you were at Cispus this time?

   _____

   _____

   _____

7. What would you suggest to make visits to Cispus better?

   _____

   _____

   _____

   _____

8. How would you rate your experience at Cispus on this scale?

   Ugh! Wow!

* Use the same kids as the ones used on "Expectation" interview.

A PARENT'S EVALUATION

OF HIS CHILD'S CISPUS EXPERIENCE

[a month or two later]

Name, number or identifying mark _____

A month or two ago your child went to Cispus for a short time. We have attempted to assess the value of that experience in many ways, and now we would like to complete our evaluation by getting <u>your personal opinion</u> of the effect that the Cispus experience had on your child.

It may be that you do not believe that the Cispus experience had any lasting (until at least now) effect. Or, it may be that you think the experience changed the entire course of his life. We believe that a statement of <u>your impressions and beliefs</u> regarding the Cispus experience will, to the extent that it is a full and candid statement, help us to make the future educational experiences of your children and the others in this school richer and more valuable.

The following "stems" are provided merely as possibly helpful jogs to your memory:

1. At Cispus, for the first time in his/her life, he/she (did) _____
   _____
   _____
   _____

2. At Cispus, he/she learned that _____
   _____
   _____
   _____

3. Because he/she went to Cispus, he/she now is able to _____
   _____
   _____
   _____

4. Before she/he went to Cispus, she/he (did) _____
   _____, but now she/he (does) _____
   _____
   _____

5. Because he/she went to Cispus, he/she now understands _____
   _____
   _____
   _____

<u>Note</u>: Please use back of page to continue commentary whenever necessary.

A TEACHER'S TAXONOMY OF LEARNING OUTCOMES

by

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Presented at the First Annual
PACIFIC NORTHWEST RESEARCH AND EVALUATION CONFERENCE
Sea-Tac Motor Inn, Seattle, Washington
May 11, 1973

A TEACHER'S TAXONOMY OF LEARNING OUTCOMES

This presentation is, basically, a set of definitions -- a matched set, actually. It is also a closed set. I think. That is my hope.

Some of you are probably perfectly happy with the term "learning outcomes." To them, let me say, "Thank you. I'll be right back." To the others, who presumably would like to know where I'm coming from when I use that term, I offer a list of seven preliminary definitions. I hope you like them. But however that may be they are intended to spell out what I shall mean by these common, basic terms as I use them in discussing the definitions I came here to talk about.

First Definition: Human behavior is any and every kind of thing which people do. This includes: blinking, humming*, reading*, walking*, swallowing, perspiring, digesting, talking*, driving a car*, responding emotionally, drawing a picture*, and twitching, all of which a good behaviorist could observe. It also includes imagining, visualizing, doing mental arithmetic*, analyzing*, contemplating, wishing, feeling an emotion, feeling a pain, enjoying, relating to previous experience, summarizing*, tasting, dreaming, deciding, and other things which cannot be observed.

Second Definition. Learned human behavior is that aspect of human behavior which has been modified by the learning process. This includes at least some of the items included in "human behavior," above, to wit...*'d items.

Third Definition: The learning process consists of three steps --

(1) Responding in some way to some set of states and stimuli.

(2) Experiencing a "reward"*.

---

*reduction in disequilibrium, really.

(3) As a consequence, being more likely to respond in about the same way the next time one experiences about the same set of states and stimuli.

Fourth Definition: Any bit of learned behavior has two aspects or dimensions which may be modified by the learning process:

(1) Effectiveness -- the extent to which it rewards (see footnote, page 1), and (2) Incidence -- the frequency with which it occurs under various circumstances.

Fifth Definition: To change the effectiveness of a person's behavior is to change his ability -- i.e., to modify one of his abilities.

Sixth Definition: To increase or decrease the incidence of a person's behavior under any given set of circumstances is to change a behavioral tendency in him -- i.e., to modify one of his tendencies.

> Note: This may be the incidence of a kind of behavior which has also been increased in effectiveness; these are two dimensions or aspects of the same behavior. However, we choose to say that two learning outcomes have been generated in such cases.

Seventh Definition: Modifications of abilities and tendencies are learning outcomes, and all learning outcomes are either modifications of abilities or modifications of tendencies. That is, we choose to ignore modifications of other dimensions of human behavior (whatever they may be!) in discussing learning outcomes.

In a manual for teachers going to Cispus Environmental Learning Center, I put it this way --

> Learning can change behavior in just two positive ways -- 1) it can make one able to do something he couldn't do before, or 2) it can make one tend to do something he didn't tend to do before. These are both, of course, a matter of degree; one is more able to do something

or one has more (or less) of a tendency to do something. Consequently, any learning product may be stated (and rated) in one of the following forms:

Form A. He is able to *bisect an angle (Skill)*

to this degree: 0 1 2 3 4 (✓ at 3)

0 = not at all; 4 = perfectly, or as well as anyone

or

Form B. He tends to *check his work (Habit)*

to this degree: 0 1 2 3 4 (✓ at 2)

0 = not at all; 4 = all the time or whenever possible

Dividing all learning products into these two types has certain advantages over use of the taxonomy of Bloom and Krathwohl (Taxonomy of Educational Objectives, N.Y.: David McKay Co., Inc.). In the first place, it's simpler (although Form A and Form B can be sub-divided and sub-sub-divided). In the second place, it deals only with directly observable behavior by either an objective observer, a subjective observer, or both; no inferences or Freudian flights of interpretation are necessary.

The basic dichotomy may be further clarified by observing that abilities (Form A) are ordinarily measured by tests, whereas tendencies (Form B) are ordinarily measured by inventories. Abilities (Form A) are thought of as how one does when he does his very best. Tendencies (Form B) are thought of as how one does typically or on the average. Abilities (Form A) include knowledge, skill, and understanding. Tendencies (Form B) include interests, attitudes, and habits.

....

One point in subdividing the types of learning products is that the different sub-types are taught in different ways. The teacher planning learning activities needs to take the differences into account. For example, if the teacher wants her class to "learn about" testing water for impurities, one set of learning activities would help them efficiently memorize the steps involved (Knowledge), another would help them develop speed and accuracy in performing the analysis (Skill), and still another set of learning activities would lead them to see why certain steps were taken in doing the testing (Understanding). Which are you after? You may well be after all three. Then all three kinds of learning activities need to be included.

....

For whoever is interested and for what it's worth, a section on "Arranging for Learning to Happen" is presented in the Appendix in the hope it may be helpful.

The other main point in subdividing the types of learning outcomes is that the different sub-types are assessed in different ways. In an assessment of understanding or knowledge, time is virtually irrelevant. In an assessment of skill, it is crucial. In an assessment of knowledge, the problem must be familiar. In an assessment of understanding, the problem must be unfamiliar. Etc. A habit must be assessed in certain specific circumstances. An interest must be assessed in a variety of circumstances. In assessing an attitude, the intensity of feeling becomes a critical dimension, and an object of the attitude is involved.

So, how may the various outcomes be distinguished? As I suggested earlier, the first step in sorting learning outcomes into the categories of the Teacher's Taxonomy is to decide whether the outcome is an ability or a tendency. The collation below may help.

Characteristics of Two Major Types of Learning Products

ABILITIES	TENDENCIES
May be described by saying: Learner is able to *define "tangent"* *(Knowledge)* to this degree 0 1 2 3 ✓4 not at all — perfectly, or as well as anyone	May be described by saying: Learner tends to *make design with a compass* *(Interest)* to this degree 0 1 2 ✓3 4 not at all — all the time or whenever possible
he couldn't, before learning	he didn't, before learning
usually assessed by using tests	usually assessed by using inventories
assessed when he's doing his best	assessed when he's behaving typically

Once this basic decision is reached, further sorting may be facilitated by the following hints and clues:

A - ABILITIES

A-1 If the objective proves to be an ability, the question remains whether it is an example of knowledge, understanding, or skill.

A-2 As already suggested (in Table 1, page 8) if the ability involves the execution of a series of two or more steps and/or a pattern of simultaneous behavior elements (as in serving a tennis ball), the ability is a skill.

A-3 If no such series or pattern is involved, and the ability involves "seeing" or "dealing with" some relationship, it is an understanding.

A-4 If, however, the ability involves merely remembering the appropriate response, it is an example of knowledge.

Table I should further clarify these distinctions.

B - TENDENCIES

B-1 If the objective proves to be a tendency, the question remai s whether it is an example of interest, attitude, or habit.

B-2 If a feeling or emotion dimension is involved, the tendency is an attitude. It will prove also to have an object -- whatever arouses the feeling or emotion -- and a characteristic response to that object.*

B-3 If the tendency has no emotional or feeling dimension and requires no conditions except an opportunity to manifest itself, it is an interest. Interests, of course, may conflict or be thwarted.

B-4 If the tendency appears only in certain circumstances or under certain conditions, it is a habit.

Table II should further clarify these distinctions.

*Knowledge differs from this both in that it is under control (voluntary) and it has no emotional content.

Table I

Learning Products: Abilities

Type of Ability	Definition	Learning it is commonly called....	Proving that one has learned it is commonly called....	Some examples of things learned which are of this type are....	This is best done by...	This can also be done pretty well by....
Knowledge	The ability, given a simple stimulus or cue, to make the correct simple response	Memorizing Noticing	Recalling Recognizing Reciting Reproducing Remembering	Multiplication tables Sight words Capitols of cities Spellings Poems (memorized) Diagrams (memorized) People's names Where things are Recipes Names of flora & fauna Formulas Dates of events Definitions Other "answers"	Cameras Tape recorders Computers	Pencil & paper
Skill*	The ability to execute a pattern of behavioral elements in proper relation to a certain environment	Practicing	Demonstrating Using	Handwriting Singing Walking Reading rapidly Doing arithmetic rapidly Following a recipe Typing a letter Making a left turn (driving) Measuring the diameter of a tube Other acts involving speed, accuracy, form, & adaptability	Machines	Chimpanzees (physical skills only)
Understanding	The ability to "see" a relationship, i.e., act as if it existed	Studying Playing	Applying Predicting & Controlling	Sounding out a word Doing a story problem Writing a haiku Using tools Using machines Raising flowers Communicating Teaching Influencing people Playing chess Etc.	Humans	

*See Harry W. Johnson, "Skill = Speed x Accuracy x Form x Adaptability," Perceptual and Motor Skills, XIII (1961), 163-170.

Table II

Learning Products: Tendencies

Type of Tendency	Definition	Learning it is commonly called....	Proving that one has learned it is commonly called....	Some examples of things learned which are of this type are....	This is most readily observed when the person....
Interest	A tendency to do something whenever the opportunity arises	Developing an interest	Engaging in....	Reading stories Reading horse stories Working puzzles Drawing Playing baseball Watching baseball Reading about baseball Other activities which yield pleasure and/or satisfaction	Has freedom and opportunity to pursue his choice
Attitude	A tendency to respond in a certain way to a certain object, and with feeling	Forming an attitude	Prejudice	*Trust *Openness *Valuing self-realization for self and others *Interdependence Plus all of the many undesirable attitudes based upon stereotypes	Does not know he is being observed
Habit	A tendency to do something under certain circumstances	Forming a habit	Having the habit of....	Frowning when one reads Writing in pencil Adding from the top, down Starting over after an error Noticing spellings of new words Listening carefully when other persons speak Brushing teeth after meals Parking near the school Checking addition Writing records slowly and carefully Making immediate notes upon observations Avoiding arguments Repeating persons' names when introduced	Is in familiar surroundings

*See Jack R. Gibb, "Trust and Role Freedom: A TORI Innovation in Educational Community," Journal of Research and Development in Education, Spring, 1972, 76-85.

EVALUATING CISPUS EXPERIENCE

PART ONE: TEACHER'S HANDBOOK

A Plan

Which Teachers May Find Useful

And an Explanation of

The Teacher's Taxonomy

Upon Which the Plan is Based

Research Section
SUPERINTENDENT OF PUBLIC INSTRUCTION
Olympia

December 1972

Acknowledgment

The Teacher's Taxonomy
was developed in 1953, under the
name "The Poor Man's Taxonomy,"
by Harry W. Johnson.

EVALUATING CISPUS EXPERIENCE

Part One: Teacher's Handbook

Table of Contents

	Page
Introduction	1
Three Approaches to Evaluating Learning	2
A Teacher's Taxonomy	3
Two Uses for the Teacher's Taxonomy	4
The Subdivisions of the Teacher's Taxonomy	6
Evaluating the Effects of Learning Experiences	10
Sorting Out Learning Outcomes	10
Appendix: Arranging for Learning to Happen	13

EVALUATING CISPUS EXPERIENCE

PART ONE: TEACHER'S HANDBOOK

INTRODUCTION

What happens to a kid who goes to Cispus? Cispus is different from his home, his school, and his neighborhood. His experiences at Cispus are different from any he's had before, and the effects are different from any he's undergone before. Our problem is to evaluate those effects.

The problem is made easier by certain advantages. First, the "Cispus experience" is easy to define. We can state quite clearly that we are interested in the effects of the experiences the youngster has between the time he enters the "campus" and the time he leaves.

Second, the experience is relatively short. Consequently

a) results are not badly confounded by the effects of "normal growth and development." If the youngster had not come to Cispus, little "normal growth and development" would have taken place in just a few days.

b) data is still relatively fresh in everyone's mind, whether it be that of the evaluator, the child being studied, or another observer of the child.

And third, the experience is continuous. The child does not alternate Cispus and non-Cispus experiences (as he does school and non-school experiences), and thus more confounding is avoided.

Another advantage we enjoy in evaluating the Cispus experience is inherent in the fact that taking kids to Cispus entails trouble and expense. That is, we may assume with some confidence that whatever results are achieved at Cispus may be credited to Cispus, since the staff would have achieved those results in an easier and/or cheaper way if they had seen how to do so.

In short, we are saying that we may evaluate a student's Cispus experience by assuming that all changes in him from the time he gets there until the time he leaves may be credited to Cispus - and then assessing those changes in the best way we can.

Our approach in suggesting what we consider "the best way we can" assess the changes which take place at Cispus will be to present a classification scheme for learning products called the Teacher's Taxonomy, and a set of carefully spelled-out approaches and steps based upon that Taxonomy. The approaches and steps -- and the Taxonomy -- may be used to evaluate any learning products, by anyone interested in the products of learning. But before we present them, we should consider one more special feature of the Cispus experience and the evaluation technique that feature suggests.

Because Cispus is as unusual as it is, many of the experiences the youngster has there are "firsts" for him. The best authority we can consult about a child's "firsts" is the child himself. Consequently we should use student self-reports in studying these "firsts." Because they are "firsts," Thorndike's good old Laws of Learning would suggest that they will be clearly remembered not only because of their Recency, but also because of their Primacy and their Intensity. We might best use some such open-ended question as

At Cispus, for the first time in my life I (did) _____

_____.

Unless we can be sure that writing fluently is easy for the child, we should present this item to him orally and record his responses on tape, if we want the fullest kind of data. In any case, whether his response is written or oral, the data from open-ended questions is sometimes difficult to analyze. In the Evaluator's Handbook, Section III, we deal with that problem at some length. The interested teacher may wish to obtain a copy. Now, however, let us turn to Three Approaches to Evaluating Learning.

THREE APPROACHES TO EVALUATING LEARNING

The Evaluator seeking to identify the products of an individual's learning experience has, basically, just three avenues open to him:

1) He may ask the learner himself about his behavior before and after the learning experience,
2) He may ask others who have had an opportunity to observe the learner's behavior before and after the learning experience,
or 3) He may observe the learner's behavior himself.

Either standardized (and commercially published) or unstandardized techniques may be used in any of these approaches. For the standardized techniques, the Evaluator is referred to Buros' Mental Measurements Yearbook (New Brunswick, New Jersey: Rutgers University Press). Some unstandardized techniques are utilized in the Guidelines and others will be suggested in our discussion of subjective reports in the Evaluator's Handbook.

By "others" in the above we mean to suggest here (a) other students, (b) student leaders, "big brothers," etc., (c) other staff members, and (d) parents -- whoever has been in the best position to observe changes between the youngster's behavior before Cispus (or some event at Cispus) and his behavior after Cispus (or some event at Cispus). Since we often cannot assume that this "other" observer has any special training or expertise in observing, we can expect from him only such data as he can collect with the simple instructions we give him. For example, we might ask such an open-ended question as "Have you noticed any changes in your child's behavior since he was at Cispus? If so, please describe them." Or we might ask a staff member to rate the youngster on a scale. Or we might ask the entire class a sociogram-type question such as, "Do you feel that since you came to Cispus you can communicate better with certain people? If so, who are the three with whom your communication has improved the most?"

In noting changes ourselves, we may use ourselves just as we would use "others" in the foregoing paragraph, or we may use techniques involving more expertise, rating the child on specific aspects of intellectual or social growth, mastery, understanding, skill, behavioral tendencies, etc.

Rating his behavior and, for that matter, deciding what kinds of behavior to rate will be made easier by first considering a classification scheme for learning products. This is the Teacher's Taxonomy.

A TEACHER'S TAXONOMY

Learning can change behavior in just two positive ways -- 1) it can make one able to do something he couldn't do before, or 2) it can make one tend to do something he didn't tend to do before. These are both, of course, a matter

of degree; one is more able to do something or one has more of a tendency to do something. Consequently, any learning product may be stated (and rated) in one of the following forms:

Form A. He is able to _____

to this degree: 0 1 2 3 4

not at all — perfectly, or as well as anyone

or

Form B. He tends to _____

to this degree: 0 1 2 3 4

not at all — all the time or whenever possible

Dividing all learning products into these two types has certain advantages over use of the taxonomy of Bloom and Krathwohl (Taxonomy of Educational Objectives, N.Y.: David McKay Co., Inc.). In the first place, it's simpler (although Form A and Form B can be sub-divided and sub-sub-divided). In the second place, it deals only with directly observable behavior; no inferences or Freudian flights of interpretation are necessary.

The basic dichotomy may be further clarified by observing that abilities (Form A) are ordinarily measured by tests, whereas tendencies (Form B) are ordinarily measured by inventories. Abilities (Form A) are thought of as how one does when he does his very best. Tendencies (Form B) are thought of as how one does typically or on the average. Abilities (Form A) include knowledge, skill, and understanding. Tendencies (Form B) include interests, attitudes, and habits.

TWO USES FOR THE TEACHER'S TAXONOMY

The Teacher's Taxonomy is offered in the conviction that it can help a teacher increase his effectiveness and save his time and energy at two points.

1) When he is planning a learning activity for one or more students,

and 2) When he is evaluating the results of the activity he planned.

Certain steps are suggested for each of these two points.

Point 1. When planning a learning activity --

Step a. Draw up a Big Chart* like this:

	Student is able to ...			Student tends to ...		
Student	(1) bisect an angle	(2) define tangent	(etc.)	(1) check his work	(2) make designs with compass	(etc.)
1.						
2.						
etc.						

The "etc,'s" suggest that you may well have more than two students and you may well want more than two columns each under "student is able to ..." and "student tends to ...." The rationale for naming the column headings is on pages 3 and 4 (from "Rating his behavior..." to bottom of page 4). The examples would probably be best classified as

bisect an angle - skill
define tangent - knowledge
check his work - habit
make designs with compass - interest

These are unusually succinct.

Step b. For each student, in each column, enter a rating (0 to 4), grade, score, or evaluative term to tell "where he is" now -- before the planned learning experience. This is also discussed in the section cited above.

Step c. Plan learning experiences for the students which you believe will yield the desired learning outcomes. There are suggestions for such planning, compatible with The Teacher's Taxonomy, in the Appendix.

*Instead of, or in addition to, this Big Chart, the teacher may wish to use the form provided in the Guidelines.

Step d. Plan how you will determine "where your students are," with regard to each column of the Big Chart, after the planned learning experiences. The techniques of Step b may be applied again.

Step e. Guess what the average score, rating, etc., will be or how you will be able to summarize where your students are, after the learning experience. Write it at the bottom of each column of the Big Chart. You now have a defensible set of objectives.

Point 2. When evaluating the result of the activity --

Step a. After the learning experience, assign each student another rating, score, or evaluative term as soon as you have carried out your plan in Step d, Point 1.

Step b. Average or otherwise summarize the students' "final" ratings, scores, or whatever you have. You now have a summative evaluation of the learning experiences you planned.

THE SUBDIVISIONS OF THE TEACHER'S TAXONOMY

Abilities, then, as stated by Form A ("He is able to ..."), are commonly called by one of three names:

a) Knowledge
b) Skill
c) Understanding

Tendencies, as stated by Form B ("He tends to ..."), are commonly called by one of three other names:

a) Interests
b) Attitudes
c) Habits

Tables I and II are designed to define, clarify, and distinguish these various abilities and tendencies, respectively.

One point in subdividing the types of learning products is that the different sub-types are taught in different ways. The teacher planning learning

activities needs to take the differences into account. For example, if the teacher wants her class to "learn about" testing water for impurities, one set of learning activities would help them efficiently memorize the steps involved (Knowledge), another would help them develop speed and accuracy in performing the analysis (Skill), and still another set of learning activities would lead them to see why certain steps were taken in doing the testing (Understanding). Which are you after? You may well be after all three. Then all three kinds of learning activities need to be included.

Unquestionably, as a trained and experienced teacher you have already developed methods for planning and evaluating learning activities. The foregoing is offered in the hope that it may be helpful and that your sojourn at Cispus may be the best possible learning experience for your kids.

For whoever is interested and for what it's worth, a section on "Arranging for Learning to Happen" is presented in the Appendix in the hope it may be helpful.

Table I

Learning Products: Abilities

Type of Ability	Definition	Learning it is commonly called....	Proving that one has learned it is commonly called....	Some examples of things learned which are of this type are....	This is best done by....	This can also be done pretty well by....
Knowledge	The ability, given a simple stimulus or cue, to make the correct simple response	Memorizing Noticing	Recalling Recognizing Reciting Reproducing Remembering	Multiplication tables Sight words Capitols of cities Spellings Poems (memorized) Diagrams (memorized) People's names Where things are Recipes Names of flora & fauna Formulas Dates of events Definitions Other "answers"	Cameras Tape recorders Computers	Pencil & paper
Skill*	The ability to execute a pattern of behavioral elements in proper relation to a certain environment	Practicing	Demonstrating Using	Handwriting Singing Walking Reading rapidly Doing arithmetic rapidly Following a recipe Typing a letter Making a left turn (driving) Measuring the diameter of a tube Other acts involving speed, accuracy, form, & adaptability	Machines	Chimpanzees (physical skills only)
Understanding	The ability to "see" a relationship, i.e., act as if it existed	Studying Playing	Applying Predicting & Controlling	Sounding out a word Doing a story problem Writing a haiku Using tools Using machines Raising flowers Communicating Teaching Influencing people Playing chess Etc.	Humans	

*See Harry W. Johnson, "Skill = Speed x Accuracy x Form x Adaptability," Perceptual and Motor Skills, XIII (1961), 163-170.

Table II

Learning Products: Tendencies

Type of Tendency	Definition	Learning it is commonly called....	Proving that one has learned it is commonly called....	Some examples of things learned which are of this type are....	This is most readily observed when the person....
Interest	A tendency to do something whenever the opportunity arises	Developing an interest	Engaging in....	Reading stories Reading horse stories Working puzzles Drawing Playing baseball Watching baseball Reading about baseball Other activities which yield pleasure and/or satisfaction	Has freedom and opportunity to pursue his choice
Attitude	A tendency to respond in a certain way to a certain object, and with feeling	Forming an attitude	Prejudice	*Trust *Openness *Valuing self-realization for self and others *Interdependence Plus all of the many undesirable attitudes based upon stereotypes	Does not know he is being observed
Habit	A tendency to do something under certain circumstances	Forming a habit	Having the habit of....	Frowning when one reads Writing in pencil Adding from the top, down Starting over after an error Noticing spellings of new words Listening carefully when other persons speak Brushing teeth after meals Parking near the school Checking addition Writing records slowly and carefully Making immediate notes upon observations Avoiding arguments Repeating persons' names when introduced	Is in familiar surroundings

*See Jack R. Gibb, "Trust and Role Freedom: A TORI Innovation in Educational Community," Journal of Research and Development in Education, Spring, 1972, 76-85.

EVALUATING THE EFFECTS OF LEARNING EXPERIENCES

Evaluating the effects of learning experiences should be easy for the teacher who has followed the instructions on pages 5-6. One simply looks at a child's score from before the learning experience -- or at an average or summary of a group's performance before the learning experience -- and then looks at the child's score or the group's average or summary after the learning experience and determines the difference. This is especially -- and deceptively -- easy if all measures are taken with standardized (or at least "objective") tests. If it satisfies your needs of the moment, by all means take that approach.

However, if you have difficulty understanding and interpreting the results of open-ended questions, free responses, etc., and relating them to goals and objectives stated in terms of the Teacher's Taxonomy, perhaps we can help with some practical hints and clues about sorting out learning outcomes.

SORTING OUT LEARNING OUTCOMES

As we suggested earlier, the first step in sorting learning outcomes into the categories of the Teacher's Taxonomy is to decide whether the outcome is an ability or a tendency. Table III may help.

Table III

Characteristics of Two Major Types of Learning Products

ABILITIES	TENDENCIES
May be described by saying: Learner is able to _____ to this degree 0 1 2 3 4 not at all ... perfectly, or as well as anyone	May be described by saying: Learner tends to _____ to this degree 0 1 2 3 4 not at all ... all the time or whenever possible
he couldn't, before learning	he didn't, before learning
usually assessed by using tests	usually assessed by using inventories
assessed when he's doing his best	assessed when he's behaving typically

Once this basic decision is reached, further sorting may be facilitated by the following hints and clues:

A - ABILITIES

A-1 If the objective proves to be an ability, the question remains whether it is an example of knowledge, understanding, or skill.

A-2 As already suggested (in Table 1, page 8) if the ability involves the execution of a series of two or more steps and/or a pattern of simultaneous behavior elements (as in serving a tennis ball), the ability is a skill.

A-3 If no such series or pattern is involved, and the ability involves "seeing" or "dealing with" some relationship, it is an understanding.

A-4 If, however, the ability involves merely remembering the appropriate response, it is an example of knowledge.

B - TENDENCIES

B-1 If the objective proves to be a tendency, the question remains whether it is an example of interest, attitude, or habit.

B-2 If a feeling or emotion dimension is involved, the tendency is an attitude. It will prove also to have an object -- whatever arouses the feeling or emotion -- and a characteristic response to that object.*

B-3 If the tendency has no emotional or feeling dimension and requires no conditions except an opportunity to manifest itself, it is an interest. Interests, of course, may conflict or be thwarted.

B-4 If the tendency appears only in certain circumstances or under certain conditions, it is a habit.

---

*Knowledge differs from this both in that it is under control (voluntary) and it has no emotional content.

If the foregoing hints are not sufficient help, you should turn to the Evaluator's Handbook. The Evaluator's Handbook contains the following sections:

I. Some Definitions

- A. Goals and Objectives
- B. Outcomes
- C. Memories

II. A Classification Scheme for Data on Learning

III. Subjective Reports of Other Learning Outcomes (besides Memories)

- A. Re Knowledge
- B. Re Skill
- C. Re Understanding
- D. Re Interests
- E. Re Habits
- F. Re Attitudes

APPENDIX: ARRANGING FOR LEARNING TO HAPPEN

A powerful "teaching technique" for helping students acquire knowledge (as it is defined here) can be derived directly from the definition in Table I and from what we know of reinforcements and rewards. The teacher must so arrange events that the learner

a) receive the "simple stimulus" (like "What is the capitol of Wyoming?").

b) be led or helped to make the "correct simple response" (like "Cheyenne").

c) immediately receive reinforcement or reward (like knowing his answer is correct).

Proper use of flash-cards provides this arrangement of events.

Another powerful "teaching technique" for knowledge is the use of mnemonic devices, as refined and described, for example, by Harry Lorraine in his book, How to Develop a Superpower Memory (New York: Fell, 1956).

This amazing approach has been used by show-business people for centuries, but has rarely achieved the respectability of classroom use and instruction.

Helping learner's gain understanding can also be described in very general terms, when understanding is defined and understood as set forth in Table I. When the teacher has identified the "relationship" the learner needs to "see" or understand, the following experiences must be arranged for the learner.

a) the learner must observe the relationship obtaining under a variety of circumstances,

b) the learner must test the relationship he thinks he sees,

and c) he must have his theory (hunch) confirmed.

To practice what we preach, let us give two or three examples.

Example I

a) learner observes that whenever he yells, his mother picks him up,

b) learner thinks he understands his mother's behavior; so the next time he gets bored he yells,

and c) his mother picks him up.

Example II

a) learner observes that anything under water -- including himself -- seems to be considerably lighter than it is out of water.

b) learner tried to pick up a large rock under water,

and c) he can.

Example III

a) learner notices (with some guidance) that "cat," "car," and "can" not only have the same letter at the left but also begin with the same sound.

b) the next time the learner encounters "c" at the beginning of a word, fortunately, it is in the word "cap" and in the sentence, "He put his cap on." Reading the sentence, he tries his hunch about "c" at the left end of a word.

c) the sentence makes sense.

Of course in all of these prescriptions for managing learning we are ignoring at least two important and closely related considerations. First, the learner must be motivated in order either to respond to stimuli and situations or to feel rewarded or reinforced. Second, fate is constantly arranging these learning circumstances in various combinations, and learning goes on willy nilly, consciously and unconsciously, all the time.

Helping learner's gain skill as defined in the Teacher's Taxonomy has been spelled out in great detail.* We shall give here the bare steps:

1) Learner sees the objective (perhaps by demonstration).

2) Learner receives demonstration and/or explanation (perhaps in slow motion).

3) Learner tries it.

4) Learner evaluates his performance.

5) Learner repeats Steps 3 and 4 a number of times, each time striving to eliminate aspects of performance which interfere with improvement and retain those which increase it.

6) Learner graduates to greater and greater challenges and higher and higher levels of performance.

*Harry W. Johnson, "Skill = Speed x Accuracy x Form x Adaptability," Perceptual and Motor Skills, 1961, 13, 163-170.

A viable strategy for fostering a habit may be seen from the definition - "a tendency to behave in a certain way under certain circumstances." If you would instill a habit in a student you must be able to arrange that, for as long as it takes:

a) he be reminded to carry out the desired behavior whenever he is under those "certain circumstances," and

b) he instantly get some reward or satisfaction (if only a check-mark on a chart).

A "camping" situation affords the 24-hour supervision which is so helpful in making such arrangements. Other non-school habit formation is much more difficult.

The development of interests can be very frustrating unless one takes into account the complex bases of interests. Some are directly interesting (the learner enjoys the process), but some are indirectly interesting (the learner wants the product of the activity - including such products as money). Some activities are interesting to the learner on an individual basis, some on a social basis. Hence, the rewards (and the incentives) which control interests may be grouped into four categories.

Table I

What Rewards Cause a Learner to Engage in an Activity (i.e., have an "interest")?

Type of Basis ↓ →	Direct	Indirect
Individual	He enjoys the physical act.	He values the product itself.
Social	He enjoys the associations	He values the membership, prestige, etc., yielded.

In order to fully control an interest, one must employ the factors indicated in the table. Using the wrong one(s) will lead to nothing.

Fostering an attitude is much like fostering a habit, with one big added problem -- the emotional dimension. One could foster a given attitude in a student if one could arrange that, for as long as it takes:

a) he be reminded and motivated to carry out the desired behavior whenever he is confronted with (or, ideally, even thinks of) the "object" of his attitude,

b) he be caused, somehow, to have a desirable emotional reaction,

and c) he instantly get some reward or satisfaction.

Comparison of these steps with the recipe for fostering habits, above, will show the added problems posed by the emotional dimension. Many practitioners, unfortunately, have simply given up and decided to settle for a change in habits. Happily, others are developing ways of arranging circumstances which will at least maximize, if not guarantee, the chance that the participating individual will be afforded the experiences called for by the recipe for fostering attitudes. For example, a highly prestigious person (to the learner) can supply both the motivation and the satisfaction involved and model the desired behavior. Eliciting the positive emotional reaction may call for further arrangements.

EVALUATING CISPUS EXPERIENCE

PART TWO: EVALUATOR'S HANDBOOK

Research Section
SUPERINTENDENT OF PUBLIC INSTRUCTION
Olympia

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EVALUATING CISPUS EXPERIENCE

PART TWO: EVALUATOR'S HANDBOOK

I. SOME DEFINITIONS

(In terms of the Teacher's Taxonomy)

A. Goals and Objectives

A-1. An educational goal or objective is an intent to change behavior from "before" to "after" by invoking learning.

A-2. The desired change, then, may be thought of as the difference between "before" and "after" (or, algebraically, "after," minus "before," or a-b).

A-3. If then, for example, you want your learner "after" learning "to be able to explain new activities," don't worry about such abilities as

a. the ability to speak English,
b. the ability to stand up, or even
c. the ability to understand the new activities.

Presumably these will have been present both "before" and "after" (if, indeed, they are essential at all). The only ability to be added is "to explain ...." This undoubtedly involves a series of steps, and is a skill.

A-4. Before, during, or after isolating the change, i.e., the real objective (as discussed above), one will want to decide whether it is an ability or a tendency. In the example in A-3, it seems that one has already labeled his objective an "ability," and since it turns out to be a skill, the tentative label was correct (see Teacher's Handbook, page 6). If the objective had been worded "to learn to explain new activities," it would still need the classification "ability," which is easily seen to apply.

A-5. Although I cannot think of an example, I suppose an objective could turn out to be a combination of an ability and a tendency. If so, the two components should be separated.

B. Outcomes

B-1. An educational outcome is the actual change in behavior which was brought about through learning. Ideally, perhaps, this would match the intended change expressed in goals and objectives before the learning (see A-1).

B-2. Just as a goal or objective is a difference (see A-2), so an outcome is a difference.

B-3. Likewise, in contemplating a stated outcome such as (to pursue the example in A-3) "I am now able to explain new activities," one should ignore the aspects present both before and after the learning experience, e.g.,

a. the ability to speak English,

b. the ability to stand up,

and c. the ability to understand the new acitivities.

The stated outcome is the newly acquired ability to explain. Such a statement requires confirming data.

C. Memories

C-1. The category "Memories" is really a practical category. That is, it is not theoretically compatible with the rest of the Teacher's Taxonomy, and items in this category need to be re-cast to fit into other categories when any analysis is done. But in practice the device "for the first time in my life I ..." elicits much valuable but fugitive data. Dealing with this data involves certain steps.

C-2. First, one must decide whether the learner's statement

a. describes one or more actions he took

or b. describes a change which took place in him.

C-3. If the learner's statement is strictly a description of one or more actions he took, the learning product established thereby is at least the knowledge, "I have taken that action in that setting." It may be

safe to presume some other learning outcomes from the fact that the learner has had that experience, but the learner's statement does not constitute evidence of those outcomes any more than evidence that the learner saw a certain movie constitutes evidence that he learned any certain thing from the movie. One needs more data in order to be certain; one does have a clear lead to such data. This may be the principal value of the response.

C-4. This learner statement simply describing one or more actions he took, in some cases may be evaluated in quite a different way. The memory itself may palpably have a value in itself -- in terms of beauty, interest, significance, etc. That is, it would seem that the memory is worth recalling from time to time for its own sake. Examples are easy to cite:

a. A blind child reports having run for the first time.

b. A little girl reports holding a snake for the first time.

c. A little boy reports having been away from home and parents overnight for the first time.

d. A young person reports having watched the sun rise for the first time.

Such memories are, of course, knowledge (see Teacher's Handbook, Table I).

C-5. If the learner's statement describes a change which took place in him as a consequence of a learning experience, the change may be any of three kinds:

a. A change in behavior - in what he is able to do. This clearly is a lead for evaluation in the "ability" category. Data is needed in order to follow up the lead. The learner's statement may include his report of such data.

b. A change in behavior - in what he tends to do. This clearly is a lead for evaluation in the "tendencies" category. Here again, data is needed in order to follow up the lead. Again, too, his statement may supply some data.

c. A change in feeling about someone or something, i.e., a report that some "object" elicits a feeling or emotion it didn't elicit before. This is evidence of an attitude change. If the new feeling-reaction is accompanied by a change in overt behavior, this is obviously a change in attitude (see Teacher's Handbook, page 11).

But feelings are facts, and the Teacher's Taxonomy recognizes internal reactions such as nausea, the sudden tightening of the stomach, the impulse to weep, etc., etc., as behavior. For some of this behavior, the only valid observation is subjective. For some, science has developed measuring instruments, techniques, and units which make objective (if indirect) observation possible. A statement that says or implies that a person now has different feelings about someone or something because of a learning experience is direct observational (i.e., hard) data regarding the formation of an attitude. It would be difficult to conceive of more direct or clear evidence of a new attitude.

II. A CLASSIFICATION SCHEME FOR DATA ON LEARNING

The evaluator of a learning experience deals primarily with two kinds of data--

a. Data about the learner's level of achievement ("how much he knows," for example), the learning "possessed."

b. Data to show whether he acquired that learning because of the learning experience in question or otherwise.

Data of either of these kinds may be direct evidence, indirect evidence, a lead to evidence, or simply a report of an experience which has been enjoyed by the learner and which suggests the presumption that evidence must exist. This is all true, that is, if you define your terms correctly. "Direct evidence" is a report that something has happened. If I report that a boy has jumped a five foot fence, that is direct evidence that he possesses that skill. A test score is direct evidence. Indirect evidence is a report that something has happened which very probably wouldn't have happened if the event in question hadn't happened. If you report that that boy won the high jump event over one who jumped five feet, that is indirect evidence that our hero jumped over five feet. In fact, the boy himself could give either direct or indirect evidence of his achievement. But if he simply says "I can jump over five feet high," that is merely a lead. It points the interested evaluator in the direction of some data. Another person's statement about the boy could be a lead, too.

Another kind of evidence, perhaps another kind of lead, is a description of an experience which the learner has had and which, in the judgment of the evaluator, suggests that the learner possesses the learning or acquired it during that experience.

Table I summarizes all of this to show the classification scheme we are suggesting for data on learning experiences.

One cell is crossed out because a description of experience which suggests the existence of evidence regarding the possession of learning would be indirect evidence.

Table I

A Scheme for Classifying Data on Learning

Types of evidence → ↓	Regarding acquisition of learning	Regarding possession of learning
Direct evidence		
Indirect evidence		
A lead to evidence		
A description of experience which suggests the existence of evidence		

Interpreting Subjective Reports

Free responses and other subjective data are sometimes difficult to deal with. The data is too rich for our systems -- the simplistic little systems we have set up with our multiple-choice items.

Subjective data can contain elements of all the types suggested by Table I. Questions of the type suggested on pages 2 and 3 of the Teacher's Handbook and in the Guidelines ("Parent's Evaluation") will tend to funnel responses into one of the categories of Table I, but one must expect a lot of slop-over.

The evaluator may be able to devise questions which yield cleaner results, but he should, of course, count the costs in richness.

III. SUBJECTIVE REPORTS OF OTHER LEARNING OUTCOMES

As suggested above (Section I-C), subjective reports can supply the evaluator with various kinds of data. Let us look at the possibilities systematically. Subjective reports can yield

A. Re Knowledge

1. Hard, direct evidence of possession (e.g., the learner states a fact he has acquired).
2. Hard, direct evidence of acquisition; i.e., the learner states or clearly implies that he acquired certain knowledge because of, or in the process of, the learning activity.
3. Indirect evidence of possession of knowledge. This might be furnished, for example, by the learner's telling of some achievement, recognition, or action.
4. Evidence which is less hard, because one cannot be certain of the meaning, but which strongly suggests or weakly demonstrates possession and/or acquisition of knowledge as a consequence of the learning experience.
5. A clear lead to evidence of acquisition of knowledge ("I learned a lot about administering group tests").
6. A clear lead to evidence of possession of knowledge ("I know the capitols of all fifty of the states").
7. A lead to evidence of acquisition or possession of knowledge which is not very clear but which may be worth checking out ("The session was really helpful").
8. A description of an experience which the learner had (and recalls) which suggests the presumption that he acquired certain knowledge ("I saw the movie about water pollution"). Of course such descriptions of experience will vary in clarity and the suggestion of presumption will vary in strength. The example "I saw the movie about water pollution" may, in certain contexts, be perfectly clear

and very strongly suggestive that the learner acquired certain pieces of knowledge. The same could be said of the statement "I collected and mounted seven different moths in those three days."

B. Re Skill

1. Indirect evidence of possession of a skill. If the learner names the steps or elements involved in a skill, this is indirect evidence that he can perform the skill. The only possible direct evidence would be in the realm of language arts (the learner, in his statement, somehow communicates skillfully).

2. A lead to evidence of possession of a skill ("I can ..."). Such leads will vary in clarity, and they may or may not be accompanied by indirect evidence of the possession of the skill.

3. Direct evidence of acquisition of a skill ("Today I learned to ..."). The evaluator will need further evidence before he can be sure this learner possesses the skill, but unless he has some good reason for doubting the learner's word, he should not need much more evidence about where or when the skill was acquired. Of course, these statements will vary in clarity, too.

4. A lead to evidence of acquisition of a skill ("I think that, because of this experience, we are a lot better at ...").

5. A description of an experience which the learner had and which suggests the presumption that skill was acquired or enhanced (see A-8 re such statements as they apply to knowledge).

C. Re Understanding

1. Direct evidence of possession of understanding. If the learner's statement includes an insight or an analysis of which he would not be capable without the understanding in question, this is hard, direct evidence of possession of the understanding, unless the evaluator has a valid reason for believing that the statement originated with someone else. Such evidence will vary in clarity, of course.

2. Indirect evidence of possession of understanding. This would consist of statements tending to prove that he can do things (cause things or deal with things) which he could not do without seeing the relationship in question. For example, indirect evidence that a teacher understands negative numbers is provided by his statement that "I was able to show her how to solve the problems involving negative numbers."

3. A lead to evidence of possession of an understanding. These would be statements saying, in effect, such things as

   a. "I see that ...."
   b. "I understand ...."
   c. "The relationship is clear between ...."

   The characteristics of such leads are discussed under A-6 & 7 and B-2.

4. Direct evidence of acquisition of understanding ("This made me see that ...," "Because of this experience I understand ...," "Now I can deal with ...," etc.) The reader should be aware of the comments under A-2 and B-3.

5. A lead to evidence of acquisition of understanding. This might be a general statement that the learning experience was "valuable," "helpful," etc., which would suggest follow-up questions to get evidence, or it might, of course, be a high rating on an evaluation scale re the learning experience. Previous comments regarding leads (A-5 & 7 and B-3 & 4) apply here as well.

6. A description of experience which suggests the presumption of acquisition of understanding (cf. A-8 and B-5).

D. Re Interests

1. Direct evidence of increased interest. This would be a statement that the learner was pursuing the interest (i.e., performing the behavior which constituted the interest) more of the time.

2. Indirect evidence of increased interest. This might be a statement that the interest-behavior produced more, cost more, or other indirect evidence that more time was being devoted to the interest-behavior.

3. Direct or indirect evidence of the existence of the interest (as against the increase). This would, of course, simply be evidence of the existence of the behavior.

4. A lead to evidence of the existence of an interest. This would be something such as "I like to ...," or "I am interested in ...." This gives no evidence that the learner's behavior actually fits the definition of "interest." It does point in that direction and suggests the gathering of more data.

5. A lead to evidence of the increase of an interest. This would be a suggestive comment such as a statement that a demonstration of the interest-behavior was "very interesting" or "inspiring," etc.

6. Description of an experience of the learner which suggests the presumption of the development of an interest. An example would be "I took a course in macramé."

E. Re Habits

1. Direct evidence of the existence of a habit. This would be a statement saying, in effect, "Whenever I ..., I ...."

2. Indirect evidence of the existence of a habit. If the habit in question causes, creates, prevents, or destroys anything, then a statement that the "thing" is being caused, created, prevented, or destroyed would be indirect evidence of the existence of the habit.

3. Direct evidence of the acquisition, increase, or decrease of the habit because of the learning experience; that is, a statement to the effect that as a consequence of the learning experience the learner now, more often, or less often does ... whenever he ....

4. Indirect evidence of the acquisition or increase (or decrease) of the habit. A statement that the "thing" mentioned in 2 above is increasing or decreasing would serve here.

5. A lead to evidence of acquisition (or elimination) of a habit. My statement about a learning experience calculated to improve habits which suggests that the experience "helped" would constitute a good lead.

6. A lead to evidence of the possession of a habit; something like "I enjoy ... when ..." or "I always ... when ...."

7. A description of an experience of the learner which suggests the presumption that the habit was "improved." For example, a youngster might report that "The movie really showed how important it is to brush your teeth after a meal" or "He showed us how dangerous it is to walk in the street."

F. Re Attitudes

1. Direct evidence of the existence of an attitude. This could be either (or both) of two kinds:

   a. a subjective statement by the learner that some person or thing tended to cause an emotional reaction in him (the "feeling" dimension). This kind of statement alone would show the existence of an attitude (unless it's untrue).

   b. a report by the learner that a person or thing tended to cause an overt reaction (the "overt" dimension). This "reaction" does not constitute an attitude unless accompanied by an emotion or feeling (see Teacher's Handbook, Table II.)

2. Indirect evidence of the existence of an attitude. This could also be either (or both) of two kinds:

   a. a report by the learner that someone else had noted and commented upon his reactions to some person or thing.

   b. a report by the learner about the effect or effectiveness of his dealings with people. Personality, after all, has been defined as the sum of one's attitudes.

3. Direct evidence of the acquisition of an attitude. This would be the same as evidence regarding possession of the attitude (F-1), except that it would also have to include something about increase or decrease.

4. Indirect evidence of the acquisition of an attitude. This would be the same as evidence regarding possession, too, except that an indication of increase or decrease is needed here.

5. A lead to evidence of the possession of an attitude. For example "I have no preconceived ideas about ..." or "I react strongly to ...."

6. A lead to evidence of the acquisition of an attitude. This could be anything like "This experience changed my whole point of view about ...."

7. A description of experience which suggests the presumption that the learner has acquired an attitude. For example, he might say "I became involved in a series of meetings about students' rights."

THE UNIVERSITY OF CHICAGO

CERTAIN EFFECTS OF GUIDING STUDY-TYPE READING BY AN ORGANIZED PATTERN OF QUESTIONS

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE DIVISION OF THE SOCIAL SCIENCES
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
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CHAPTER III

THE FACTOR OF ORGANIZATION IN LEARNING

As stated in Chapter I, the hypothesis underlying this thesis is that reading a set of questions, the point of view and organization of which are clear and simple, will facilitate the comprehension and increase the retention of the content of the passage covered by the questions. Moreover, the hypothesis suggests that such a set of questions will produce greater comprehension and retention than an otherwise equivalent set of questions lacking any clear organization or unitary point of view. Since the hypothesis has not been experimentally tested as a whole, support for it must consist of an argument the steps of which have support from experimental evidence. Hence the evidence assembled in the present chapter concerns the validity of the following two statements:

> 1. The amount comprehended and retained from a piece of material by a learner in a given period of time increases with the learner's increased ease in arriving at an organization of the material.
>
> 2. Once the organization of one body of material is grasped, a new body of material in which the learner recognizes the same organization will be more readily learned than it would have been without the previous experience. That is, the process of organizing material to be learned can be, at least largely, completed before the material is seen, by means of seeing the organization in other material and then transferring grasp of the organization to the new situation.

It will be seen that the two statements constitute an argument

for the hypothesis and that evidence supporting them would constitute evidence for the hypothesis.

"Learning" and "Organization" Defined

Before the evidence supporting the foregoing statements can be clearly discussed, definitions of "learning" and "organization" must be given which indicate the meanings here intended by those terms.

The term "learning" is used widely today and with little discrimination. As a consequence, it has many referents which are frequently confused. In order that the meaning intended in the present discussion may be clearly identified, an attempt will be made to list the various types of behavior commonly termed "learning" and to indicate those types to which the term is intended to refer in the discussion that follows.

Various common meanings of the term "learning" may be differentiated and related according to the following outline:

Learning

A. Acquisition of behavioral tendencies
   1. habits
   2. attitudes
   3. interests
      etc.

B. Development of Skills

C. Memorization
   1. of non-linguistic experience
   2. of linguistic experience

D. Comprehension
   1. of non-linguistic experience
      a. identification of individual phenomena (objects, events, attributes, etc.); involves recognition of similarities between identified phenomenon and

phenomena of previous experience, to the end that a name or qualifying term can be applied to the phenomenon, a use can be made of it, etc.--a function of the learner's experience and his ability to identify familiar attributes.

b. perception of relationships among a series or group of phenomena--a function of the learner's experience, his ability to identify familiar attributes, and his ability to attribute relations to various phenomena in a group or series.

c. induction or deduction from a series or group of phenomena--a function of the learner's experience, his ability to identify familiar attributes, ability to attribute relations to various phenomena in a group or series, and ability to make inductions or deductions.

d. interpretation and evaluation of a group or series of phenomena in the light of previous experience (including linguistic experience) as in watching a football game--a function of the learner's experience, his ability to identify familiar attributes, his ability to make inductions, and his ability to relate past and current phenomena.

2. of linguistic experience

a. understanding of individual words or phrases--a function of the learner's vocabulary and experience.

b. understanding of the meaning denoted by a passage, i.e., by a selection longer than a word or phrase--a function of the learner's vocabulary and experience and his ability to interpret grammatical structures.

c. induction or deduction on the basis of various parts of the passage--a function of the learner's vocabulary and experience, his ability to interpret grammatical structures, and his ability to make inductions or deductions, as the case may be.

d. interpretation and evaluation of material in the light of previous experience (including linguistic experience)--a function of the learner's vocabulary and experience, his ability to make inductions or deductions, and his ability to perceive relationships between current and past experience.

A few explanatory remarks should be made about the foregoing outline. Since it was prepared soley to clarify the present discussion and since this discussion is very little concerned with the acquisition of behavioral tendencies or the development of skill, those areas of behavior were not analyzed. On the other

hand, this discussion is concerned with comprehension and memorization of linguistic experience, particularly through reading. Therefore, it was deemed important to distinguish, first, between memorization and comprehension of liguistic experience (i.e., experience through interpretation of symbols). Furthermore, it seemed important to distinguish the various possible levels of comprehension in reading.

A hypothetical example will help to clarify the levels of comprehension of linguistic experience. Suppose that four subjects read the same passage and comprehend it at the four levels described. Suppose, then, that they are asked for a description of the material. The subject who comprehends at the lowest level might reply that the passage was "all about boats and pieces of lead and water and stuff." The reader who comprehends at the second level might describe the passage as saying that a man put a ball of lead foil into water and it sank and that he then molded the lead foil into the shape of a boat, put it on the water, and that it floated. The third subject might say that the writer showed that the shape of a piece of material, as well as its weight, determines whether it will float in water. The reader who read at the highest level of comprehension might report that the passage described a classroom experiment demonstrating Archimedes' principle.

Several facts about the outline should be clarified by the hypothetical example. First, it should be clear that the example involving reading could readily be converted into one involving hearing a lecture, speech, or broadcast. Second, it should be apparent that although the levels of comprehension can

be distinguished, degrees of comprehension may vary greatly within each level. Third, it should be obvious that the subjects exhibited not only comprehension of the material but also retention of it. This is a common characteristic of all reading-test responses.

The first and second levels of comprehension should not be confused with memorization. A test response exhibiting retention devoid of understanding would consist of a parrot-like repetition of words used in the passage or a recognition of them, as in a multiple-choice test. Paraphrasing would not be found in such a response. A subject whose retention was perfect would be able to reproduce the entire passage verbatim, but, if he did not understand any of it, the words would be merely sounds. As will be shown by evidence to be reviewed later in this chapter, memorization completely devoid of understanding is psychologically impossible.

After the analysis of the comprehension of linguistic experience had been drawn up, comprehension of non-linguistic experience was analyzed. An attempt was made to follow the pattern of the analysis of linguistic experience, to see whether comprehension of non-linguistic experience also fell into four levels comparable to the levels of comprehension of linguistic experience. This attempt was made on the theory that comprehension of linguistic experiences involves processes similar to those in comprehension of non-linguistic experience, and the attempt seems to have been successful. Consequently, the task of deriving generalizations which will apply to both types of comprehension

is greatly facilitated. That is not to say that by the process of definition a psychological similarity has been established between the "comparable" levels of comprehension of linguistic and non-linguistic experience. For the present, such a similarity is merely posited. It will be dealt with more fully in the course of interpreting the findings of the present study.

Another hypothetical situation should clarify the meanings intended by the four levels of comprehension of non-linguistic experience. Suppose that four subjects, of four levels of ability capable of the four levels of comprehension, enter a hotel lobby. Subject number one, comprehending on the lowest level, might see a chair and, recognizing the characteristics of that object similar to those of objects previously encountered, express his recognition of it as a chair either by saying the word "chair" or by sitting on it. Likewise, he might express recognition of food, water, elevators, dogs, fights, running (by a bell hop), etc., by naming them or reacting appropriately. The second subject might express perception of relations among phenomena experienced by imitating someone's pressing of a button in order to hear the sound of the chimes which delighted him, by moving a piece of furniture which blocked a door he wished to open, by imitatively turning off a light, etc. The subject comprehending at the third level might express inductions and deductions from his observations by concluding that the desk clerk was in command of the lobby because everyone, staff and guests, seemed to follow his directions, or by concluding that the hat-check girl was selling hats. A sophisticated subject introduced into a hotel

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lobby would comprehend at the fourth level, finding the lobby an only relatively novel situation, and behave in a "normal" manner on the basis of his previous experience with similar situations. Recognizing the cigar counter for what it was, he might purchase a cigar and newspaper and proceed to complete the observational period in a comfortable chair. While doing so, he might note the fact that people entering wore wet raincoats and remark that it seemed to be raining outside.

One conclusion suggested by this example is that although comprehension of linguistic experience is strictly human behavior, the two lower levels, at least, of comprehension of direct experience could be carried on by sub-human subjects. This, however, does not necessarily destroy the parallel which has been posited. With the exception that linguistic experience is exclusively human behavior, the four levels of comprehension of ~~direct~~ non-linguistic experience are comparable to the four levels of comprehension of ~~vicarious~~ linguistic experience. In other words, it seems likely that a subject capable of any given level of comprehension of ~~direct~~ non-linguistic experience would, given ability to handle symbols, be capable of the comparable level of comprehension of ~~vicarious~~ linguistic experience.

It should be emphasized that the outline and subsequent discussion have presented definitions of terms, not experimental evidence. If the reader admits the existence of the various types of behavior described and the presence of distinctions between those various types, the object of the outline and discussion is achieved with the labelling of the various types of

behavior. The only room for criticism of the outline is its implication that it embraces all of the major areas of human behavior commonly referred to as "learning." If such a major area of behavior has been neglected, the outline is inadequate to that extent by implication. To repeat, the purpose of the outline is simply to clarify discussion.

In the ensuing discussion, the term "learning" will be avoided wherever a more precise term can be employed. When "learning" is used without quotation marks, it will refer either to all of the forms of behavior suggested by the term or to a form of behavior within that area which some investigator under review has not defined clearly enough so that a less general term may be applied.

"Organization," according to Webster's Collegiate Dictionary, is "the act of arranging or constituting in interdependent parts, each having a special function or relation with respect to the whole." This recognized common usage of the term should suffice for the purposes of the present discussion if it is understood that the arrangements, functions, relations, etc., may be logical, temporal, or spatial or musical. Two corollaries of the definition will receive greatest emphasis: (1) organization is an active process, and (2) it consists of establishing relations among members of the group or series organized.

Organization and Comprehension

The first task in the support of our hypothesis is to show that the amount comprehended and retained from a piece of material in a given period of time increases with the learner's